

CLAIMS

What is claimed is:

1. An incubator for use with a magnetic resonance (MR) system, the incubator minimizing an amount of interference generated during an MR scan of the incubator, comprising:
 - an incubator housing, comprising,
 - a patient compartment;
 - an aggregate compartment coupled to the patient compartment;
 - an electronics compartment coupled to the aggregate compartment;
 - an incubator frame, wherein the incubator frame and the incubator housing are constructed as a uni-body assembly; and
 - a means for inhibiting insertion of the electronics compartment of the incubator housing into the MR system.
2. The incubator of claim 1, wherein the inhibiting means comprises at least one elongated member coupled to the incubator frame.
3. The incubator of claim 1, wherein the inhibiting means comprises at least one electrical switch, wherein the electrical switch disables operation of the MR system upon insertion of the electrical compartment into the MR system.
4. The incubator of claim 1, wherein the incubator is constructed from non-conductive components.
5. The incubator of claim 4, wherein the non-conductive components comprise non-metallic components.
6. The incubator of claim 5, wherein the non-metallic components comprise plastic components.

7. The incubator of claim 1, wherein the incubator is constructed from components that are transparent to a magnetic field generated by the MR system.
8. The incubator of claim 1, wherein the incubator is constructed from non-magnetic components.
9. The incubator of claim 8, wherein the non-magnetic components are selected from the group consisting of strontium, phosphor-bronze, beryllium-copper, copper, aluminum, silver and gold.
10. The incubator of claim 1, further comprising:
a metal container secured to the electronics compartment; and
an electric motor secured inside the metal container.
11. The incubator of claim 10, wherein the metal container is secured inside the electronics compartment.
12. The incubator of claim 1, further comprising:
a power supply for providing power to the incubator, the power supply comprising a transformer, said power supply being remotely located relative to the incubator and the MR system.
13. The incubator of claim 12, wherein the power supply is located at least five feet from the incubator and from the MR system.
14. The incubator of claim 1, further comprising at least one filtering means, wherein the at least one filtering means reduces time varying gradient magnetic field interference.

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15. A method for improving the compatibility of a magnetic resonance (MR) accessory for maintaining or monitoring the health of a patient while undergoing magnetic resonance imaging (MRI) with an MR system, comprising at least one of the steps of:

- reducing an interference between the accessory and a static magnetic field of the MR system;

- reducing an interference between the accessory and a time varying gradient magnetic field of the MR system;

- reducing radio frequency (RF) interference between the accessory and the MR system; and

- reducing electro-magnetic interference (EMI) between the accessory and the MR system.

16. The method of claim 15, wherein the step of reducing the interference between the accessory and the static magnetic field of the MR system includes the steps of

- forming the accessory from non-interference generating components; and
- isolating electrical components from the MR system.

17. The method of claim 16, wherein the step of forming the accessory from non-interference generating components includes the step of forming the accessory from non-conductive components.

18. The method of claim 17, wherein the step of forming the accessory from non-conductive components includes the step of forming the accessory from non-metallic components.

19. The method of claim 18, wherein the step of forming the accessory from non-metallic components includes the step of forming the accessory from plastic components.

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20. The method of claim 16, wherein the step forming the accessory from non-interference generating components includes the step of forming the accessory from components that are transparent to a magnetic field generated by the MR system.

21. The method of claim 16, wherein the step forming the accessory from non-interference generating components includes the step of forming the accessory from non-magnetic components.

22. The method of claim 21, wherein the step of forming the accessory from non-magnetic components includes the step of forming the accessory from at least one of strontium, phosphor-bronze, beryllium-copper, copper, aluminum, silver and gold.

23. The method of claim 16, wherein the step of forming the accessory from non-magnetic components includes the step of using metallic components that have a low permeability.

24. The method of claim 15, wherein the step of reducing the interference between the accessory and the static magnetic field of the MR system includes the step of shielding electrical components.

25. The method of claim 24, wherein the step of shielding electrical components includes at least one of:

placing electro-magnetic components within a magnetically shielded structure; and

locating electro-magnetic components remotely from the MR system.

26. The method of claim 24, wherein the step of locating the electro-magnetic components remotely from the accessory and the MR system includes the step of locating the electro-magnetic component at least five feet from the MR system.

27. The method of claim 15, wherein the step of reducing the interference between the accessory and the time varying gradient magnetic field of the MR system includes the step of using a filter in at least one signal line.

28. The method of claim 27, wherein the step of using a filter in at least one signal line includes at least one of:

- shunting interference signals to ground; and
- blocking interference signals from passing through the at least one signal line.

29. The method of claim 15, wherein the step of reducing the interference between the accessory and the time varying gradient magnetic field of the MR system includes at least one of:

- minimizing a number of moving metallic parts of the accessory; and
- placing metal sections away from a gradient cross-over along a magnet axis.

30. The method of claim 15, wherein the step of reducing RF interference between the accessory and the MR system includes the step of filtering at least one of an active line and a passive line.

31. The method of claim 16, wherein the step of placing a filter in at least one of an active line and a passive line includes the step of using at least one of an active filter and a passive filter to filter the RF interference.

32. The method of claim 30, wherein the step of filtering at least one of an active line and a passive line includes at least one of:

- shunting RF signals to ground; and
- blocking RF signals from passing through the active line and the passive line.

33. The method of claim 15, wherein the step of reducing EMI between the accessory and the MR system includes the steps of:

- shielding at least one electronic component in an RF tight box;
- using shielded cable for at least one signal line; and
- grounding at least one signal line.

34. The method of claim 15, further comprising the step of using at least one of an incubator, a patient monitor, a ventilator, an injector, a syringe pump as the MR accessory.

35. The method of claim 15, further comprising the step of inhibiting improper insertion of the accessory into the MR system.

36. The method of claim 35, wherein the step of inhibiting improper insertion of the accessory into the MR system includes the step of using at least one of an electrical stop and a mechanical stop.